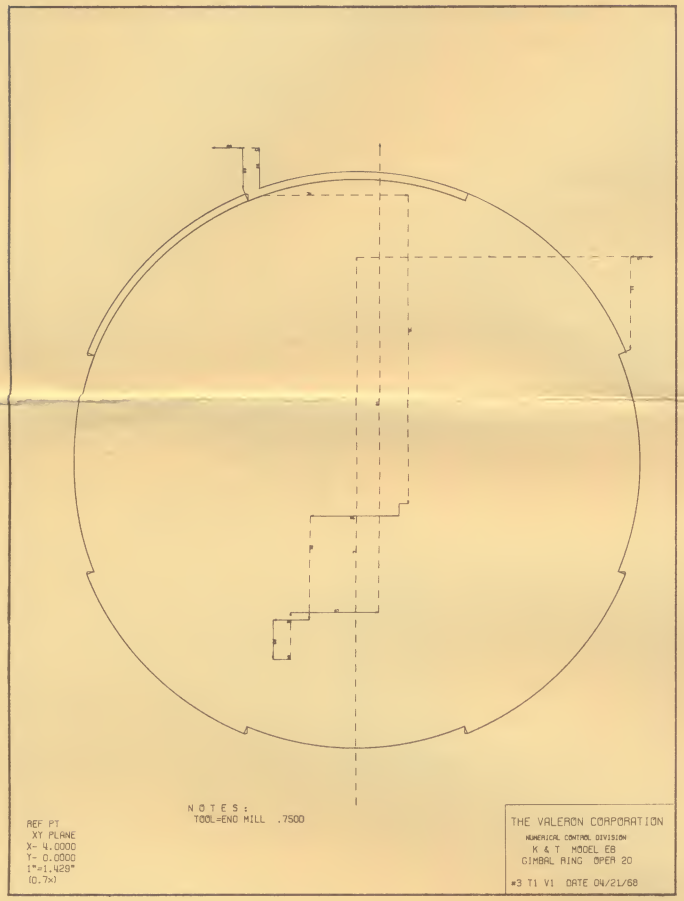
September/October 1968

DIGITAL PLOTTING NEWSLETTER

CALIFORNIA COMPUTER PRODUCTS, INC. — 305 Muller Avenue, Anaheim, California 92803



NC TAPE VERIFICATION SERVICE

The Numerical Control Division of the Valeron Corporation in Oak Park, Michigan, offers completely engineered tooling, programming, and computer services to users of numerically-controlled machining equipment. NCD services are available to supplement a client's in-plant facilities, or to provide everything from engineering drawing to finished part. In the area of computer programming for numerically-controlled machines, NCD writes tape programs for jobs requiring the most advanced computer methods, and uses a CalComp high-speed Model 110/663 on-line digital plotting system with an IBM/360 computer to provide NC tape verification drawings. The plotter, in combination with a special computer program, produces a drawing which shows the path the machine tool will take and the dimensions of the finished part. From this drawing, NCD experts can check the geometry for continuous path cuts, point-to-point positioning errors, or any combination of output. The sample plot shown here is a verification drawing for a gimbal ring.

CalComp 663 plotter at Valeron Numerical Control Division provides control tape verification drawings.

NEW DISPLAY TECHNIQUE FOR TOPOLOGICAL NETWORKS

The Institute for Scientific Information in Philadelphia offers a wide range of information services to clients in the scientific community. These services are designed to enable the individual scientist to keep up with the literature in his own sphere, and to stay abreast of developments in peripheral disciplines. ISI's services provide information from over 1800 periodicals, and 20 million indexed computer entries are developed each year covering authors, titles, subject terms, etc. In a study directed toward improved and automated techniques for display of topological networks, particularly bibliographical cross-references used in historical research or scientific and technical literature searches, the Institute developed a new format called "Diagonal Display." The accompanying illustrations show two versions of a PERT

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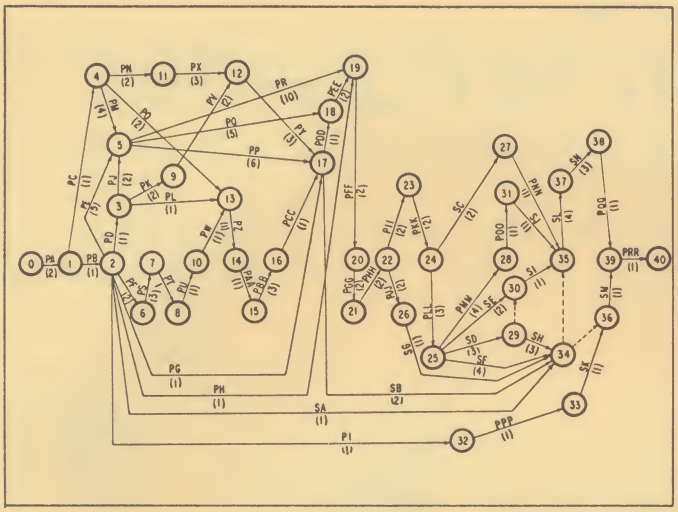
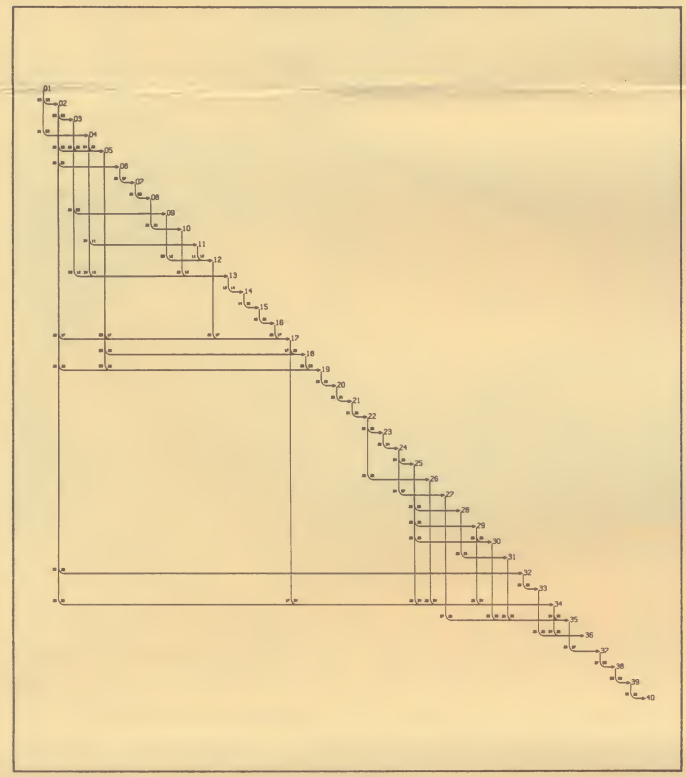
BEMA
10TH ANNUAL BUSINESS EQUIPMENT EXPOSITION & CONFERENCE
INTERNATIONAL AMPHITHEATRE—CHICAGO—OCTOBER 28-NOVEMBER 1, 1968





TOPOLOGICAL NETWORKS . . .

(Continued from page 1)

chart: a conventional display, and a plotter diagram using the diagonal display technique. The latter was plotted by a CalComp 563 digital plotter operating on-line with an IBM 1401 computer. Other examples, and full details on the display technique, are given in a report titled "Diagonal Display—A New Technique for Graphic Representation of Complex Topological Networks," by Dr. Eugene Garfield and Dr. Irving H. Sher, President and Vice President, respectively, of ISI. The study was conducted under a contract with the U.S. Air Force, Office of Scientific Research. The computer/plotter program allows display of at least 100 nodes and an unlimited number of interconnections between nodes. For more information, contact the Institute of Scientific Information, 325 Chestnut St., Philadelphia, Pa. 19106.

3-D GRAPHS AID SEA WAVE ANALYSIS FOR USMDL

The sample plots shown are from a paper titled "A Directional Analysis of Sea Waves from Bottom Pressure Measurements," by Carl M. Bennett of the U.S. Navy Mine Defense Laboratory, Panama City, Florida. The diagrams were drawn by a CalComp 570/563 plotting system at USMDL, operating off-line with an IMB 704 computer. Data were collected in the Gulf of Mexico during a period in 1965 which included the time of Hurricane "Betsy". The two-dimensional graph shows bottom pressure power spectra at a particular period of time, and the three-dimensional diagram shows the directional power spectrum at the same period. Input data were obtained from two differential pressure transducers located 11 miles off-shore at a depth of 104 feet, and two miles off-shore at 63 feet.

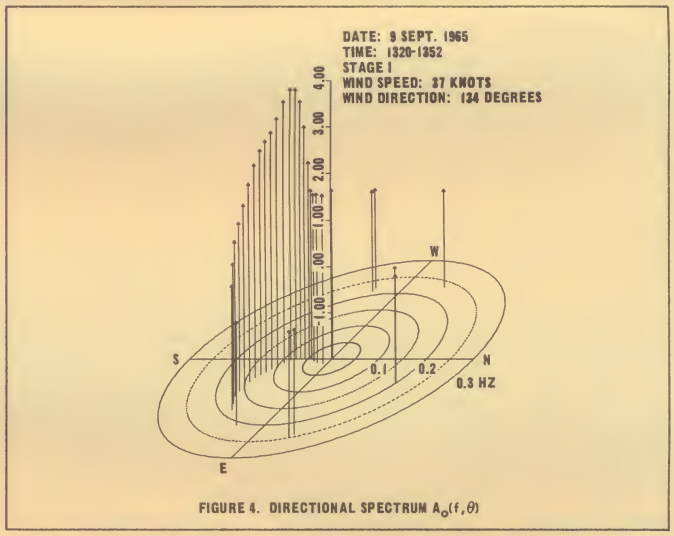


FIGURE 4. DIRECTIONAL SPECTRUM $A_o(f,\theta)$

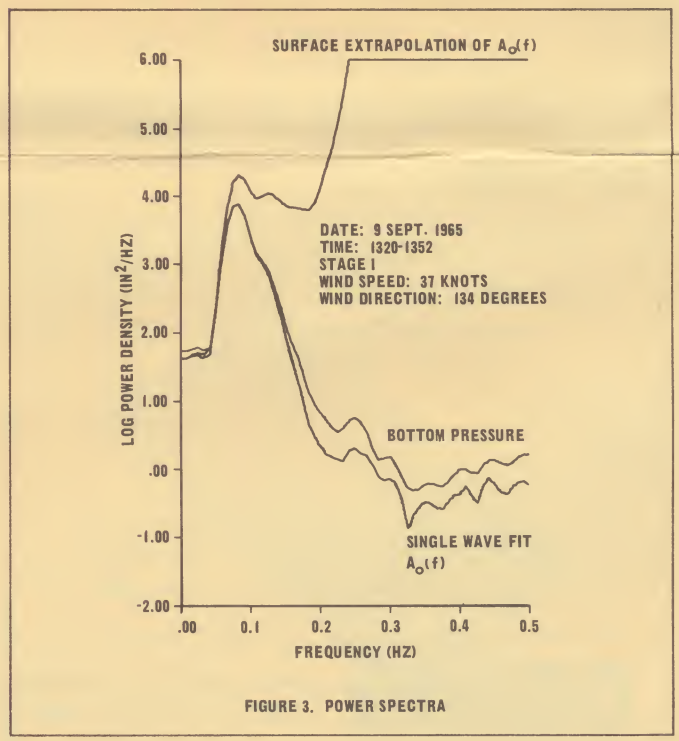
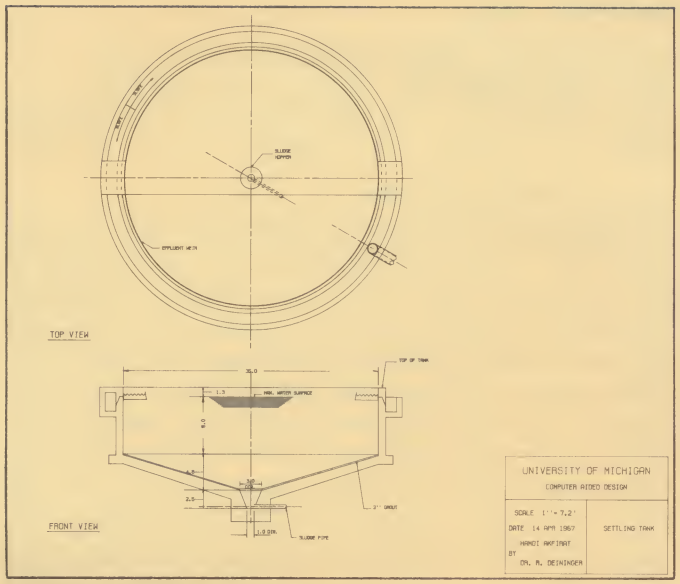
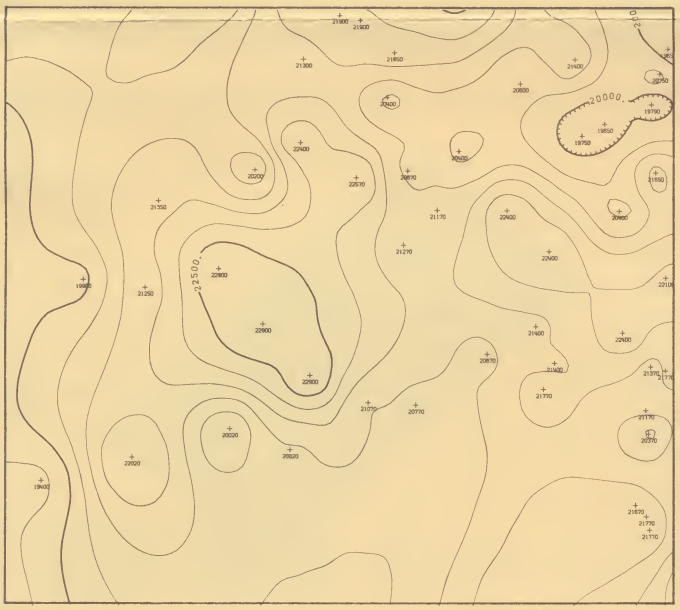


FIGURE 3. POWER SPECTRA



ZIP SYSTEM PLOTS SEWAGE PLANT DESIGNS

Computer-aided design is one of the fastest growing areas of application for the digital computer, and the ability to produce high quality, accurate engineering drawings automatically makes the computer an even more valuable design tool. The drawing shown here, submitted by Dr. Rolf A. Deininger of the Department of Environmental Health at University of Michigan, Ann Arbor, is a primary circular settling tank which forms part of a waste water treatment plant. Dr. Deininger's department has developed special computer programs in MAD and FORTRAN for this work, supported by research funds from the U.S. Public Health Service and the Office of Water Resources Research. The drawing was produced by a CalComp Model 763 Zip Mode plotter operating off-line with an IBM 7090 computer. Processing and execution time for this sample was about 2 minutes, plotting time 9 minutes.



BUSINESS GRAPHICS TO BE SPOTLIGHTED AT BEMA

Billed as "a 30 million dollar showcase of all that's newest in management technology," the 10th Annual Business Equipment Exposition and Conference will be held at the International Amphitheatre in Chicago, October 28 through November 1, 1968. Marking our fourth year at the BEMA show, CalComp's newest digital plotting systems and special software for business applications will be demonstrated in an 800 square foot booth in the Southeast Area of the Amphitheatre. We hope to see you there. But if you can't make it to the Chicago show, there are still three more chances to see CalComp products in action this year: American Institute of Aeronautics and Astronautics (A.I.A.A.) convention at the Civic Center, Philadelphia, Pa. October 21 through 25, 1968, the Visual Communication Congress at Convention Hall, Philadelphia, November 5 through 8, and the Fall Joint Computer Conference at Brooks Hall, San Francisco, December 9 through 11.

WHAT'S NEW? . . .

Service Contract Policy

CalComp recently announced a revised policy and reduced prices on service contracts for digital plotting systems and accessories. Service contracts are written for a one-year period, and a 10% discount is offered if the service contract is purchased with the equipment. On-site contract service by factory-trained CalComp personnel is now available to all CalComp customers within the 48 contiguous states at the reduced rates. For full details and price quota-

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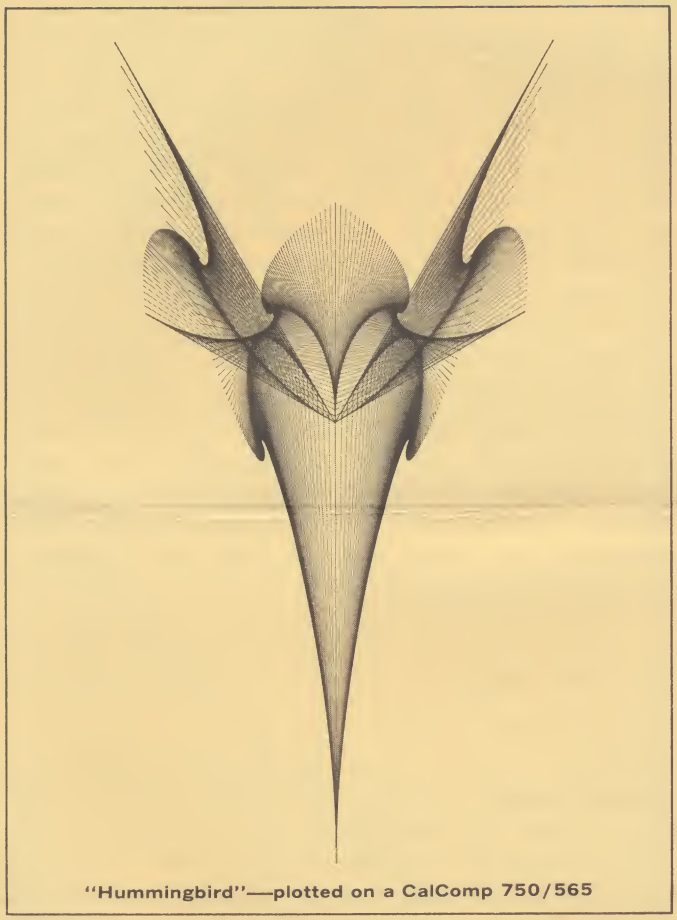
NEW CONTOURING PROGRAM

CalComp's new General Purpose Contouring Program (GPCP) automatically plots functions of two independent variables in the form of contour diagrams or maps. GPCP is written in FORTRAN IV and can be used with any CalComp drum or flatbed system in the 500, 600 or 700 Series, on-line or off-line. It is the most accurate general purpose contouring program available today, is easy to use, and provides the greatest possible flexibility in contouring. The program uses a gridding technique which analytically constructs a smooth surface passing through every data point, resulting in contours that are more accurate than with "weighting" or least squares fitting methods. Among the many important features of GPCP are provisions for outputting computed values, for inserting corrected values, flexibility of input data source and format, and almost complete flexibility of the graphic presentation. For details, see your local CalComp sales representative or send for Bulletin 240.

The Gallery of Fine Art



"Hummingbird"—plotted on a CalComp 750/565

CALCOMP ENTRY WINS TOP AWARD IN MAGAZINE CONTEST

A three-color version of the drawing shown here, titled "Hummingbird," won first prize and the front-cover position in the sixth annual computer art contest sponsored by *Computers and Automation* magazine. Programmed on CalComp's GE 425 computer and plotted on an off-line Model 702 Zip Mode flatbed system, the drawing was created by Kerry Strand and Gary Craigmile. The winning entry and the runners up appeared in the August 1968 issue. We don't like to brag, but of the 29 entries published in the magazine, 20 were drawn on CalComp equipment. And speaking of prize-winning plotter art, don't forget to send your entries for the CalComp art contest *before November 1,* to CalComp Awards, Suite 523, 2975 Wilshire Blvd., Los Angeles, Calif. 90005.

EARTH SCIENCES WORKSHOP

Fifth of a series of meetings on computer applications in the earth sciences will be held December 11-13 at the University of Kansas. The meeting is to be a workshop in which participants collect and process data and interpret results via the computer. The workshop is sponsored by the Kansas Geological Survey, U.S. Geological Survey, and the University Extension.

WHAT'S NEW? . . .

(Continued from page 3)

tions, contact your nearest CalComp sales and service office.

Remote Plotting Systems

A complete new series of transmitting and receiving units for remote plotting with CalComp systems is now available. The Model 611 Off-Line Dataphone Transmitter Module can be installed in any Model 760, 770 or 780 off-line tape unit and provides high-speed remote plotting with 500, 600 and 700 series plotters. The unit converts tape unit plotter commands to a serial data train for interface with Bell System Model 201A or 201B Data Sets and a CalComp Model 621 Remote Dataphone Receiver/Plotter Controller. The 611 can also be connected directly to the 621 through a coaxial cable up to 5000 feet in length. The Model 621 decodes the serial data and controls the plotter operation. The Model 612 On-Line Dataphone Transmitter Module is similar to the 611 except that it is designed for use with and mounts inside any CalComp on-line plotter controller in the 110-series. For details, contact your local CalComp sales office or write for Bulletin 252.

THREE-D SOFTWARE KEEPS TABS ON COMPUTER USAGE

CalComp's THREE-D software package provides for automatic perspective drawing of any three-dimensional surface that can be expressed as a function of two independent variables. In the sample shown here, the program was used to chart computer usage by job number and programmer over a 15-month period. The height of the vertical bars (Z axis) is proportional to computer time on CalComp's in-plant GE 425. Numbers along the X axis identify the individual job or project, and numbers on the Y axis identify the programmers. For full details on the THREE-D program, written in FORTRAN IV, see your local CalComp sales representative, or write for Bulletin 239.